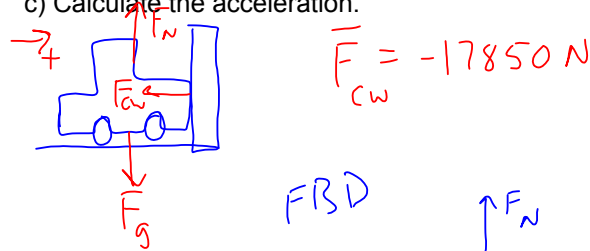


A car with a mass of 1500 kg collides with a wall with a force of -17850 N.

- Draw a picture.
- Draw a free-body diagram.
- Calculate the acceleration.



x-direction only

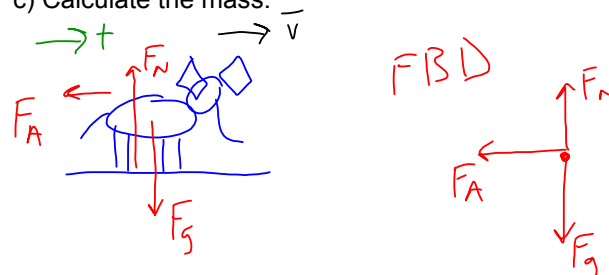
$$\sum \vec{F} = m\vec{a}$$

$$\vec{F}_{cw} = m\vec{a}$$

$$\begin{aligned}\vec{a} &= \frac{\vec{F}_{cw}}{m} \\ &= \frac{-17850 \text{ N}}{1500 \text{ kg}} \\ &= -11.9 \text{ m/s}^2\end{aligned}$$

An elephant stops with a force of -1800 N with an acceleration of -2.0 m/s/s.

- Draw a picture.
- Draw a free-body diagram.
- Calculate the mass.



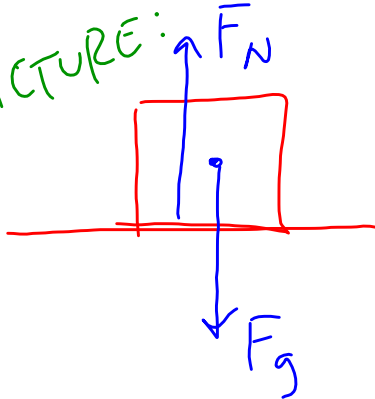
$$\vec{F}_A = m\vec{a}$$

$$\begin{aligned}m &= \frac{\vec{F}_A}{\vec{a}} \\ &= \frac{-1800 \text{ N}}{-2 \text{ m/s}^2}\end{aligned}$$

$$= 900 \text{ kg}$$

• FREE - BODY DIAGRAMS:

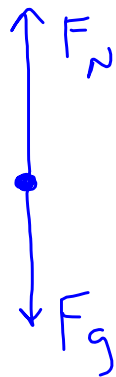
PICTURE:



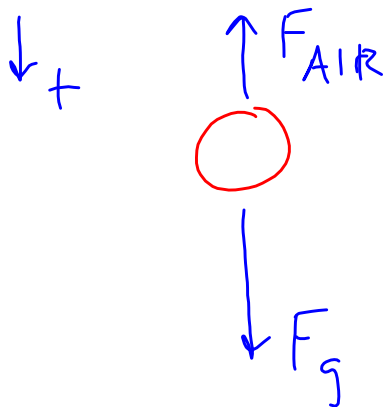
$$\Sigma \vec{F} = m\vec{g} \rightarrow \phi$$

$$\Sigma \vec{F} = \phi$$

FBD



Ball falling, with air resistance



$$\Sigma \vec{F} = m\vec{a}$$

$$\vec{F}_g - \vec{F}_{air} = m\vec{a}$$

